Exhibit II-11

1991 EUS SERVICES MARKET OPPORTUNITY BY AREA AND INDUSTRY ($ MILLION)

Industry	2	4	5	7	8	10	11	Total
Banking	$88	$32	$56	$44	$44	$64	$72	**$400**
Insurance	31	10	24	14	11	15	20	**125**
Discrete Manufacturing	196	138	184	138	115	150	230	**1,150**
Process Manufacturing	94	101	109	109	80	138	94	**725**
Distribution	148	61	88	83	61	55	55	**550**
State/Local	77	50	72	54	41	77	81	**450**
Telecomm etc.	140	78	109	85	78	110	171	**775**
Federal	36	17	28	77	28	30	61	**275**
TOTAL	**$816**	**$487**	**$670**	**$604**	**$458**	**$645**	**$784**	**$4,450**
Other Industries								**300**
								$4,750

Note: Numbers do not cross-foot due to rounding.

MARCH 1992

CONSULTING OPPORTUNITIES IN END-USER SYSTEMS

Final Report

Prepared
for
IBM Corporation

INPUT®

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Client/Server Study Questionnaire A-1

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I

Introduction

A

Background and Definitions

IBM is planning to offer consulting services to address client needs in support of end-user systems (EUS). Exhibit I-1 shows the definition of "client/server" systems, which has been used as the working definition for describing the target client.

Exhibit I-2 defines the EUS services that IBM is considering offering.

These EUS services will be in the context of the entire information services industry, illustrated in Exhibit I-3. EUS services cut across boundaries and include services located in the following delivery mode segments:

- Professional services
- Systems operations
- Systems integration (to a lesser degree than the two previous categories)
- Turnkey systems/VARS

Note: Vendors from other segments—such as computer stores, equipment manufacturers or systems software producers—may also offer these services.

IBM is planning to target establishments with 50 or more employees because relatively few of the smaller establishments have networked LANs. In addition, IBM believes that marketing to the smaller establishments would prove relatively difficult. Exhibit I-4 shows that the size of IBM's target market, in terms of number of employees, is somewhat over half of the U.S. work force.

B

Scope of This Study

IBM commissioned INPUT to conduct a study based on primary research that would address the following:

- The size and growth of the market, broken down by industry and IBM marketing areas
- The size of the major offerings (i.e., strategy and planning, design, implementation, and support and operations)
- The relative importance of the individual offerings planned (i.e., those listed in Exhibit I-2)
- Current sources of service, broken out by self support, central IS support, and vendor support
- Reasons for using an outside vendor
- Buyer values in selecting an outside vendor for supplying these types of services
- Strengths and weaknesses of major potential vendors that could offer EUS services, including IBM

C

Methodology

The primary means of research was structured interviews conducted with knowledgeable people within enterprises using end-user systems (as defined in Exhibit I-1).

A questionnaire was developed in conjunction with IBM for conducting the interviews. (A copy of the questionnaire is included as Appendix A.)

The questionnaire was used to conduct 267 telephone interviews, which were conducted in December 1991 and January 1992. The interviews were stratified by industry and geography.

- Exhibit I-5 shows the distribution by vertical market.
- Exhibit I-6 shows the distribution by IBM marketing Area.

In addition, respondent firms were classified by size.

Respondents were selected on the basis of their knowledge of EUS services. The vast majority of respondents were in technical positions (either inside or outside the formal IS department). The level of the respondent ranged from vice-president to technical specialist.

- About two-thirds of respondents were in management positions (see Exhibit I-7).
- As would be expected, there was a greater probability of speaking to an executive in a smaller establishment than a larger one.
- By the same token, the greater specialization in larger firms made it somewhat more likely that a technical specialist would be a respondent in a larger firm.

It is interesting that fewer than 20% of respondents had the title "LAN manager" (or a similar title). This is in keeping with the great variation in the types of titles encountered in this study, as shown in Exhibit I-8. As will be commented on later, INPUT believes that this fact has implications for market maturity as well as sales strategies.

Work sessions were held with an IBM group that was coordinating this study on January 17, February 7, and February 19. A presentation of the major findings of the study was made to EUS staff on February 27, 1992.

Exhibit I-1

Client/Server in This Study

Included

- A server-based local-area network (LAN) that is connected to other LANs or host computer systems
- Multifunction workstations using Intel or RISC architectures

Excluded

- A single-function workstation like those used on the factory floor or in a point-of-sale system
- Server-based LANs that may be used within the information systems department mainly for IS technical support

These factors were used to qualify respondents for the study.

Exhibit I-2

EUS Services

- Strategy and planning
  - Analysis of needs
  - Technology plans
  - Application/data analysis
  - Relationships to other systems
  - Financial justification

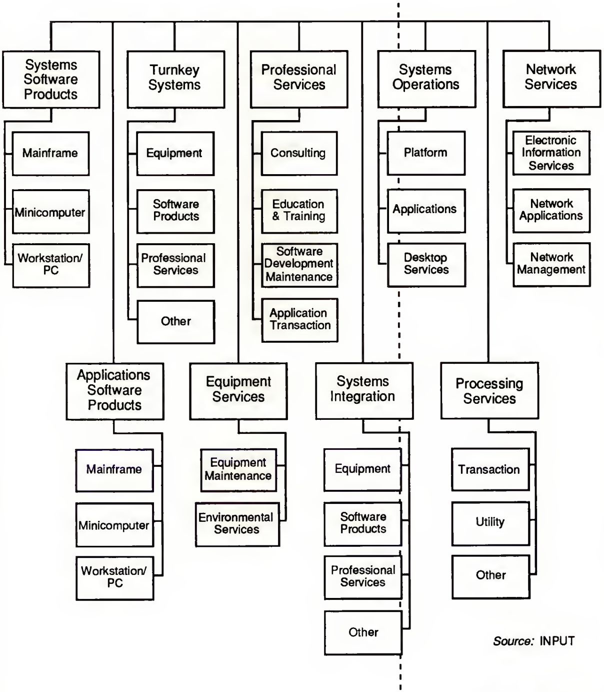
- Design
  - Application design and prototyping
  - LAN design
  - Data base design
  - Product evaluation and selection
  - Configuration design
  - Systems management guidelines
  - Multivendor standards

- Implementation
  - Product acquisition (including LANs)
  - Hardware installation and testing
  - Connectivity to other networks
  - Packaged software installation and testing
  - Custom software development
  - Multivendor hardware integration
  - Multivendor software integration

- Support and operations
  - Help desk and defect support
  - Problem analysis and performance management
  - Hardware and software changes
  - Backup and recovery
  - LAN operations and management
  - Software distribution
  - Education and training

Exhibit I-3

Information Services Industry Structure—1992



Source: INPUT

Exhibit I-4

EUS Target Market: U.S. Employees by Establishment Size

Establishment Size	Employees		EUS Target
	Millions	%	
Under 50	37.3	45	Not targeted
50 and Over	46.1	55	Targeted

Exhibit I-5

Number of Interviews by Vertical Market

Vertical Market	Number of Interviews
Banking/Finance	32
Insurance	32
Discrete Manufacturing	32
Process Manufacturing	36
Wholesale/Retail Distribution	33
State/Local (including Education)	38
Telecommunications, Utilities, and Transportation	33
Federal	31
Total	267

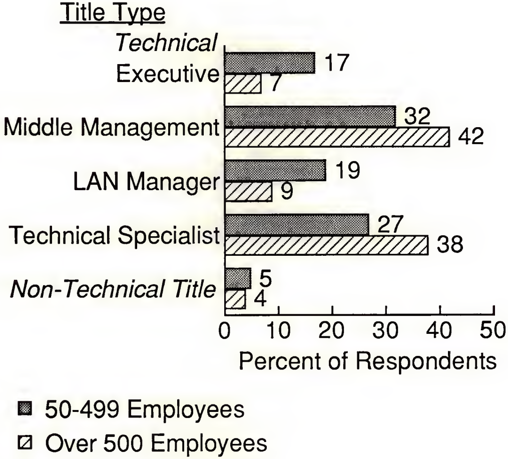
Exhibit I-6

Number of Interviews by IBM Area

Area		Number of Interviews
2	Northeast	36
4	Great Lakes	22
5	Mid-Western	58
7	Mid-Atlantic	29
8	Southeast	17
10	Southwestern	57
11	Western	48
	Total	267

Exhibit I-7

Distribution of Respondent Titles by Establishment Size



Titles classified by INPUT.

Exhibit I-8

Sample of Respondent Titles

- Assistant Vice President
- Automation Specialist
- Computer Coordinator
- Data Communications
- Data Processing Manager
- Data Processing Manager
- Data Processing Specialist
- Director and Vice President
- Director of Information Systems
- LAN Support
- Management Information Systems Administrator
- Management Information Systems Officer
- Manager, Mini Micro Development
- Manager of Data Processing
- Manager of Technical Support
- Manager, PC End-User Computing
- Micro Supervisor
- Network Administrator
- Network Administrator
- Network Manager
- Network Manager
- Network Manager
- PC Coordinator
- PC Programmer Analyst
- C Specialist
- PC Support Analyst
- PC Support Supervisor
- PC/LAN Manager
- Senior Analyst
- Senior Information Services Analyst
- Senior Technical Coordinator
- Support Analyst
- Systems Consultant
- Systems Manager
- Technical Systems Manager
- Vice President, Data Processing
- Vice President, Information Services
- Vice President, Management Information Systems
- Vice President, Office Automation

Note: Randomly selected sample titles of 39 respondents

II

U.S. EUS Services Market Size

A

Overall Market

INPUT estimates the 1991 EUS services market in the U.S. was $4.750 billion in 1991. Support and operations comprise almost half this market, with design and implementation each accounting for about one-quarter of the market; strategy and planning represent about one-tenth of the market (see Exhibit II-1).

Exhibit II-2 shows the methodology used to calculated the market size. Spending per node was the key figure derived from INPUT's research. The number of nodes in 1991 was taken from IBM's "Wave III" study, which interviewed 18,000 U.S. businesses.

EUS services represent about one-sixth of all EUS expenditures reported by INPUT's respondents (see Exhibit II-3), which places overall EUS-related spending at about $30 billion in 1991. Obviously, hardware (largely workstations and servers) accounts for a large portion of this spending.

From the standpoint of increasing EUS services penetration, the in-house personnel area represents a significant target of opportunity:

- Many in-house personnel functions can be replaced one-on-one by externally-provided services.
- The size of in-house expenditures (roughly 60% more than the amount now spent on services) makes this an attractive target.

INPUT believes that this known or budgeted amount on in-house personnel may actually understate the actual amounts spent on internal EUS support. Some sizable amount of EUS-related applications development, for example, is conducted by staff members who are budgeted elsewhere (e.g., staff who only spend part-time on development projects or who are charged to a functional department).

In order to scope the order of magnitude of such development activities, INPUT asked respondents to estimate the amount of personnel time (on a full-time-equivalent basis) that was spent on developing EUS applications. Converting these resources to a cost per node (using the methodology shown in Exhibit II-4) provided an estimate of in-house EUS-related applications development costs of about $5 billion in 1991. This represents a long-term opportunity to vendors supplying EUS services.

Based on the data provided by respondents, INPUT forecasts budgeted growth of 7% compounded annual growth rate (CAGR) for current EUS. INPUT believes that this growth is a minimum for currently installed client/server systems for the following reasons:

- Many EUS areas do not have formal budgets; in some cases budgets were created "on the fly" for the INPUT interview. This situation often understates future spending.
- Even where there is a more formal organization, planning as such is in a very early stage; again, this often understates what will actually be accomplished in the future. Even if future initiatives have been identified in general, the budget specifics have not been worked out.
- Management of EUS is still often reactive; additional items and functions are often not identified until shortly before they are implemented.
- Some responses were affected by the current recession. (INPUT believes these are a relatively small number.) While the current economic climate should not in principle deflate future plans, in the real world it does.

In addition to budgeted growth of current EUS, there is also the important factor of the underlying growth in networked LAN systems themselves. Based on the projections made by respondents of increases in servers, the overall number of nodes, and the increasing proportion of employees working on LANs, INPUT believes there will be an increase in EUS of 25% annually up to 1994.

This growth represents a large increase in the underlying market and an increase that is for the most part not included in the 7% increase in current budgets. These new LANs and users will sometimes not be managed in the current organization structure, and their budgets will represent a net increment. It is also likely that these newly organized LANs will be more intensive users of externally provided services.

Exhibit II-5 summarizes these two areas of growth; the combined compound growth rate is 30% to 1994. INPUT believes that the total growth rate will begin to taper off at that time as networked LAN growth runs out of standalone workstations to absorb.

Although INPUT has confidence in its market sizing and growth forecasts, there are factors that can affect the apparent size of this market as well as the actual growth:

- As noted, the extent to which current in-house staff functions are converted to external services can affect market growth.
- EUS services can be delivered as part of a larger, "top-down" systems integration project. These services are for the most part not counted in this study (and usually not known by this study's respondents). This issue is analyzed further in Chapter IV.
- As noted earlier, a possibly substantial amount of EUS expenditures are not made in any EUS or LAN budget but are spent by individual users or as part of a function department's regular spending. The situation is analogous to spending on PCs in the 1980s, when often only a proportion of PC spending could be identified by any single unit within an enterprise.
- Last, and certainly not least, in INPUT's opinion, as major vendors become more established within this market, their (successful) performance in delivering and marketing of EUS services will have a positive impact on market growth. The current very fragmented state of this market does not permit this type of vendor leadership. (See Chapter V for an analysis and discussion of the competitive situation.)

Exhibit II-6 summarizes this situation.

Finally, the EUS services market should be put into the context of overall U.S. information services market. Exhibit II-7 shows the current size and projected growth of this market.

- Note that EUS services represent under five percent of this total market (and about 15% of the analogous market).
- The growth rate for EUS services is well over twice that for the market as a whole.

B

EUS Service Market Components

In addition to providing market sizing estimates for the overall U.S. market, INPUT also provides breakdowns of market components.

Exhibit II-8 shows the breakdown by vertical industry.

- Discrete manufacturing represents the largest opportunity
- Process manufacturing and the telecommunication/utilities/transportation sector represent a strong number two.
- Most of the other sector are in the $400-500 million range, with federal and insurance appreciably lower.
- These sizings map reasonably well against the relative sizings for other type of information services.

Exhibit II-9 shows the variations in growth rate among the industry groups.

- Process manufacturing and banking and finance represent average growth about five percentage points above the 30% compound rate shown in Exhibit II-5.
- The telecommunication/utilities/transportation group also shows above average growth.
- Insurance and distribution should grow at less than the average rate, in part reflecting medium-term problems in their underlying businesses.
- Government at all levels should show the lowest growth in the next three years.

Exhibit II-10 shows the EUS services market size by IBM area. The geographic market opportunity is a factor of the industry mix and, largely, the underlying amount of economic activity within each area. Exhibit II-11 combines the data from Exhibits II-9 and II-10 to show the matrix of market size by industry by IBM area.

Exhibit II-12 shows INPUT's estimates for the EUS services market by individual city, using the IBM trading area (or trading areas in the case of cities with multiple trading areas) as the unit for making these allocations.

INPUT also analyzed the data by size of establishment.

- Smaller establishments (i.e., those under 500 employees) spent about 10% more per node on the average for EUS services.
- However, based on the Wave III data, this size of firm was not as highly penetrated by LANs.

Exhibit II-8 shows the breakdown by vertical industry.

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INPUT also analyzed the data by size of establishment.

- Smaller establishments (i.e., those under 500 employees) spent about 10% more per node on the average for EUS services.
- However, based on the Wave3 data, this size of firm was not as highly penetrated by LANs.

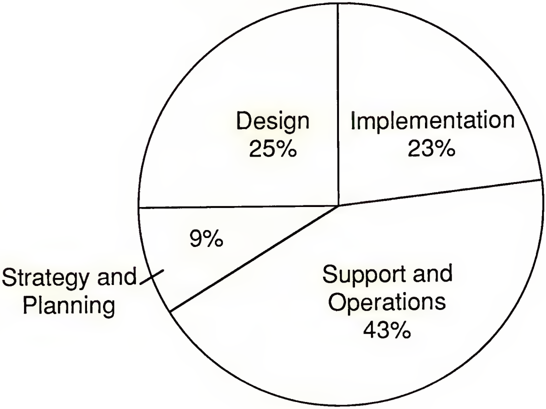
- These two factors tend to cancel out. Therefore, INPUT does not believe that establishment size affects the relative intensity of EUS services use.

Obviously, though, large establishments/enterprises with LANs managed centrally represent the larger opportunity, all things being equal. However, large enterprises should be treated with caution from a marketing standpoint:

- In many cases, LANs represent "islands of automation." About one-quarter of respondents interviewed could not speak for the entire organization.
- One would expect over time for groups of LANs to coalesce under a common management. However, purchasing decisions may still be decentralized. (This study did not address this issue.)

Exhibit II-1

1991 U.S. EUS Services Expenditures by Type of Service



1991 Services Market = $4.750 billion

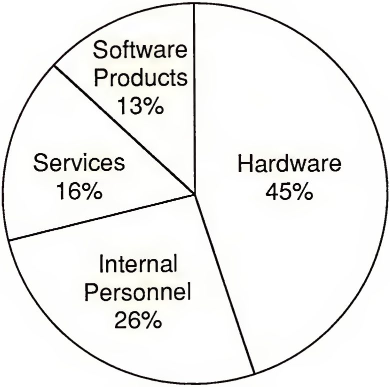
Exhibit II-2

Methodology for Deriving U.S. EUS Services Market Size

- Average EUS services spending reported for 1991 = $164,000
- Average number of LAN nodes = 355
- Average spending per node: $164,000/355 = $462
- Number of nodes = 10.3 million
- 1991 EUS spending:
  - Number of nodes X spending per node
    10.3 million X $462 = $4.750 billion

Exhibit II-3

1991 EUS Expenditures



Total EUS Market = $30 billion

Exhibit II-4

Estimate of In-House Applications Development Costs, 1991

- In-house applications development staff = one-half of a full-time equivalent (FTE) per 100 nodes
  - FTE costs (with overhead) = $100,000/year
  - One-half FTE = $50,000
- Applications development cost per node = $50,000/100 = $500 per node
- 10.3 million nodes X $500 = $5.2 billion

Note: Applications development staff costs are partially counted within "EUS staff costs" (shown in Exhibit II-3).

Exhibit II-5

EUS Services Growth Components, 1991-1994

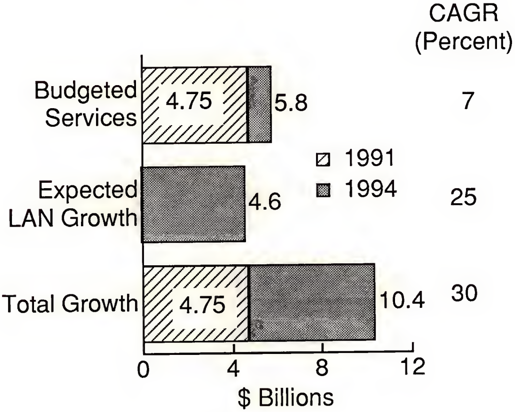


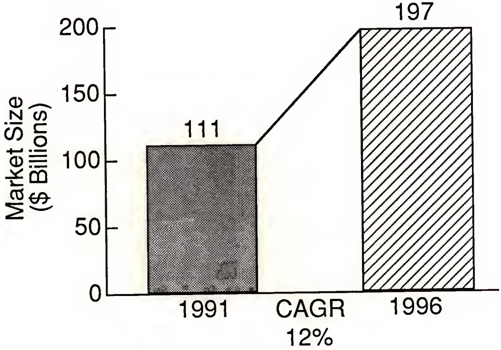
Exhibit II-6

Additional Factors Affecting Size and Growth of EUS Services Market

Factor	Apparent Size	Growth
Conversion of in-house staff functions to externally provided services		X
EUS services delivered via systems integration	X	X
Conversion of "off-budget" EUS service items to on-budget	X	
Impact of vendor performance in delivering and marketing EUS services		X

Exhibit II-7

U.S. Information Services Market, 1991-1996



INPUT

Exhibit II-8

1991 EUS Services Market Size by Industry

Industry Group	Market Size ($ Millions)
Banking/Finance	400
Insurance	125
Discrete Manufacturing	1,150
Process Manufacturing	725
Wholesale/Retail Distribution	550
State/Local (including Education)	450
Telecommunications, Utilities, and Transportation	775
Federal	275
Other	300
Total	4,750

Exhibit II-9

1991 EUS Services Market Size and Growth Rate by Industry

Industry Group	Market Size ($ Millions)	Points Above or Below Average Growth Rate
Banking/Finance	400	+5
Insurance	125	-3
Discrete Manufacturing	1,150	0
Process Manufacturing	725	+5
Wholesale/Retail Distribution	550	-3
State/Local (including Education)	450	-5
Telecommunications, Utilities and Transportation	775	+3
Federal	275	-5
Other	300	N/A
Total	4,750	

Exhibit II-10

1991 EUS Services Market Size by Area

Area	Market Size ($ Millions)	
	Includes Federal	Excludes Federal
2 Northeast	850	825
4 Great Lakes	525	500
5 Midwestern	750	725
7 Mid-Atlantic	675	600
8 Southeast	475	450
10 Southwestern	675	625
11 Western	800	750
	4,750	4,475

Exhibit II-11

1991 EUS SERVICES MARKET OPPORTUNITY BY AREA AND INDUSTRY ($ MILLION)

Industry	2	4	5	7	8	10	11	Total
Banking	$88	$32	$56	$44	$44	$64	$72	$400
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TOTAL	**$816**	**$487**	**$670**	**$604**	**$458**	**$645**	**$784**	**$4,450**
Other Industries								300
								$4,750

Note: Numbers do not cross-foot due to rounding.

INPUT

Exhibit II-12

Estimated 1991 EUS Services Expenditures by Major Cities

City*	EUS Expenditures ($ Millions)
Atlanta	125
Boston	300
Chicago	350
Dallas	95
Detroit	100
Los Angeles	330
Minneapolis	130
New York	310
Philadelphia	210
St. Louis	120
San Francisco	150
Washington, D.C. (Non-federal)	75

* "City" data based on trading areas associated with that city—e.g., Boston includes MA, NH, ME; New York includes Long Island and Westchester.

III

EUS Service Requirements

There are two aspects to EUS service requirements:

- The application, or content, focus of the required service

- The functional services required (as described in Exhibit I-2)

Exhibit III-1 shows respondents' current and planned applications. Note that this was an open-ended question, and there were no constraints or expectations as to what these applications are or would be. At a subsequent stage of analysis, the applications were grouped as shown in Exhibit III-1.

- The current mix of applications shows a predominance of off-the-shelf personal productivity applications: word processing and spreadsheets. This is not surprising, given the history of PCs and the past motivations for linking them.

- It is noteworthy that there are relatively fewer planned applications in the personal productivity areas than in more complex and business-related functions: office and industry-specific applications. This will have implications for future service offerings, staff capabilities, and sales approaches.

The respondents were also asked to rate the importance of the specific components of EUS services. Exhibit III-2 shows the ratings for the components of strategy and planning. (Note that these are the same categories shown in Exhibit I-2.) There are several observations that can be made:

- With the exception of financial justification, there is a relatively small amount of difference in the importance given to the different components.

- There is virtually no change seen between 1991 and 1994.

- The ratings cluster very close to 3.0, which is the average rating—that is, neither good nor bad.

One technical question, from the standpoint of data analysis, is whether these ratings hide meaningful information. For example, at times an "average" rating really shows a clustering at both ends of the scale, with the high raters potentially representing a niche market.

INPUT did additional analyses in order to test for these kinds of factors. Exhibit III-3 shows an analysis of the responses to the ratings for "relationship to other systems," which received an overall rating of 3.1.

- Exhibit III-3 shows the distribution for the different responses, "1" through "5."
- If the ratings had been evenly distributed, each rating would have been given by 20% of the respondents. The actual distribution was not perfect, but with the exception of that given for "2," came quite close to an even distribution.
- The only discontinuity, was the surplus of "1" ratings, compared to "2" ratings, which is suggestive (but only suggestive) that once people find this component unimportant, it is completely unimportant.

This same kind of tendency is shown for financial justification (the lowest rated component). Exhibit III-4 shows that almost half of respondents found this potential offering completely unimportant.

The problem for IBM (or any vendor of these services) is that—even for financial justification—11% of respondents found this component very important. This type of relationship was constant across component ratings:

- There were few variations in ratings by such categories as industry or size. The variations found were so infrequent that INPUT believes that they are probably due to sample variations and not because of underlying differences. (This lack of variation was also the case for geography, but INPUT did not expect that this type of rating would show meaningful variation by geography.)
- INPUT believes that this lack of variation in perceived importance is due to several market-related factors:
  - The client/server environment is still relatively new in many firms. Precise needs are still emerging.
  - Similarly, the people involved in these activities are often new to their jobs and their roles are still being defined.

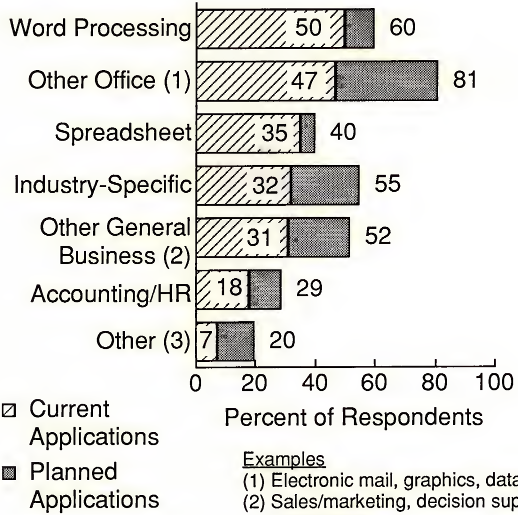
- Perhaps most importantly, service is still being supplied in a reactive manner in many firms. There is relatively little formal planning, except that arising from the need for LAN expansion.

From this lack of variation INPUT would draw the conclusion that most requirements are potentially important to the firms interviewed, but firms find it very difficult to place one function requirement consistently above another at this time.

Exhibits III-5 through III-7 show the same sets of ratings for design, implementation, and support and operations. The same comments and findings for strategy and planning apply to these components.

Exhibit III-1

Application Focus

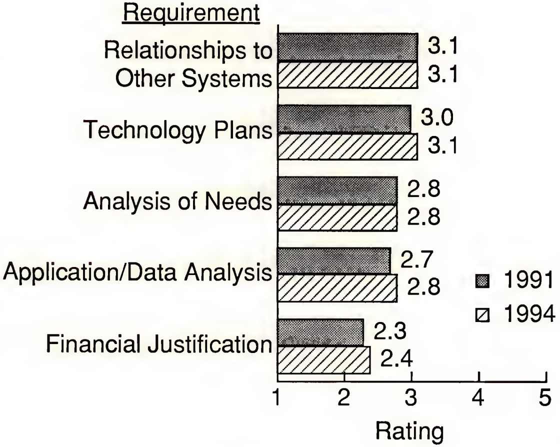


Open-ended question coded

Examples
(1) Electronic mail, graphics, data base
(2) Sales/marketing, decision support, forecasting
(3) 3270 emulation, branch support

Exhibit III-2

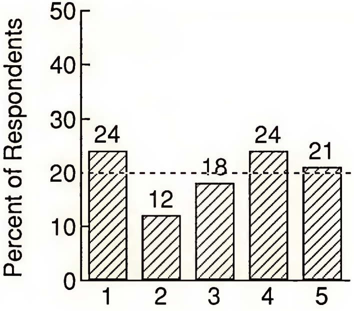
Service Requirement Ratings
Strategy and Planning



Differences of 0.4 or less are not meaningful.
Key: 1 = not important; 5 = very important

Exhibit III-3

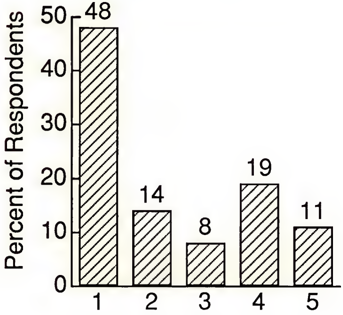
Distribution of Ratings Relationship to Other Systems



Mean = 3.1

Exhibit III-4

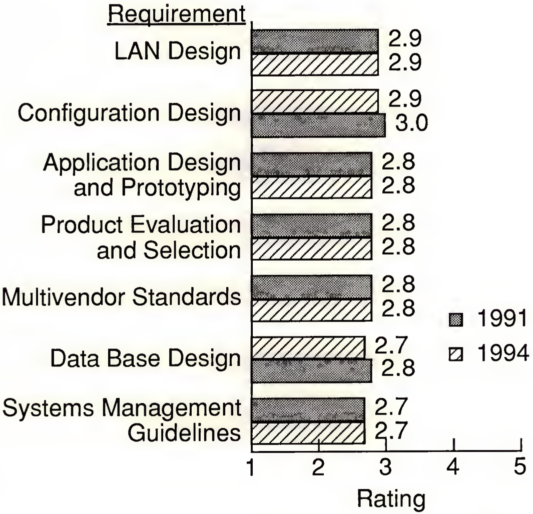
Distribution of Ratings Financial Justification



Mean = 2.3

Exhibit III-5

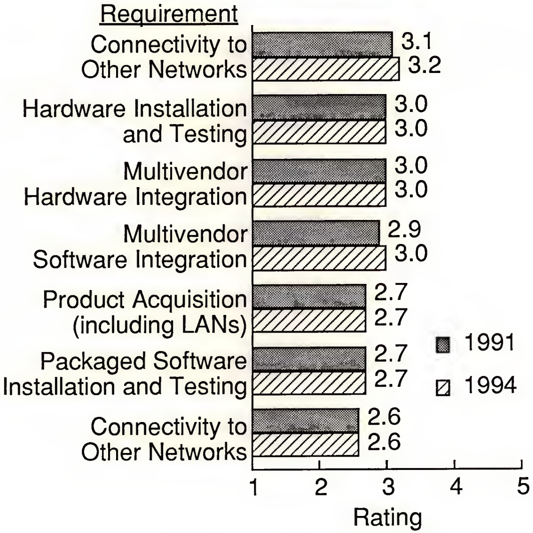
Service Requirement Ratings
Design



Differences of 0.4 or less are not meaningful.
Key: 1 = not important; 5 = very important

Exhibit III-6

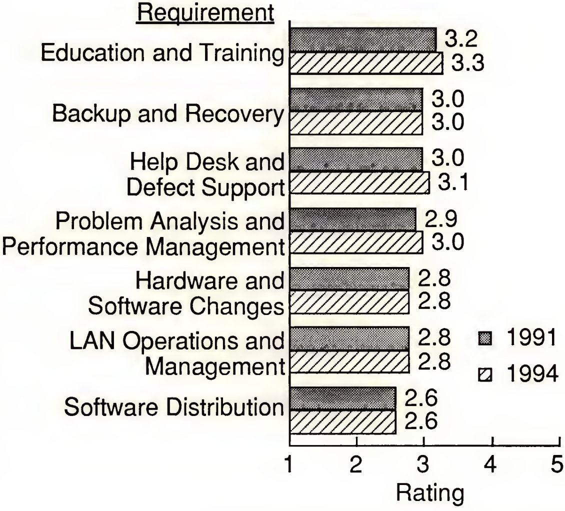
Service Requirement Ratings Implementation



Differences of 0.4 or less are not meaningful.
Key: 1 = not important; 5 = very important

Exhibit III-7

Service Requirement Ratings
Support and Operations



Differences of 0.4 or less are not meaningful.
Key: 1 = not important; 5 = very important

IV

Use of External Suppliers of Services

A

Current Suppliers

EUS service needs are now supplied from a combination of sources:

- In-house, both self-support by end users as well as support by a central IS department
- Commercial vendors

Currently, over half of end users provide at least some of their own support (Exhibit IV-1). However, much EUS support is still provided by the central IS department (Exhibit IV-2).

The major reason volunteered for using an external vendor of services was the vendor's expertise and knowledge (Exhibit IV-3). Cost savings and the lack of in-house staff were secondary reasons. Exhibit IV-4 provides examples of actual reasons provided.

Exhibit IV-5 looks at the next step: if a vendor is being selected, what are the most important selection criteria.

- Except for vendor size, all criteria were of at least medium importance.
- The most important criteria represent a formidable list: quality, experience (both general and specific), speed, reputation and price.

The generally high (and varied) importance levels for vendor-selection criteria should be contrasted to the lower, more clustered ratings for service components discussed in Chapter III (Exhibits III-3 and Exhibits III-5 through III-7).

- In INPUT's opinion, these importance levels indicate that respondents have had considerably more experience in dealing with vendors than they have had in planning for particular services.

- INPUT believes that with more experience purchasers of EUS services will become more discriminating in the types of functional services that they place the most importance on.

Along these same lines, INPUT asked respondents an open-ended question on the advice they would give to a prospective vendor planning to offer EUS services. Exhibit IV-6 shows that skills and knowledge again rank highest, followed by responsiveness and customizing services to the customer's needs. Interestingly, price, *per se*, did not rank highly. Examples of particular advice are given in Exhibit IV-7.

B

Purchasing of EUS Services: Alternatives

EUS services can be purchased as:

- A component of a larger undertaking ("systems integration")

- A standalone purchase

The systems integration approach often involves a broad business issue—e.g., can the order-entry process be made cheaper, faster, and more responsive to customers?

The typical steps involved in systems integration could involve the following:

- General, high-level consulting: business problems and requirements analysis

- Analysis of application requirement and design alternatives

Whether or not EUS is involved would often not be known until well into the design phase.

In contrast, standalone EUS services are much more pragmatic in nature. LAN-based solutions are generally assumed.

Exhibit IV-8 contrasts the differences in the processes involved. The critical differences from the standpoint of supplying EUS services include:

- Whether or not there will be a LAN-based solution in the systems integration environment is often not known until very late in the process.

- Vendors offering only EUS services cannot become involved early in the systems integration process, since the demand for their services is unknown.

- By the time it is known that there is a need for LAN-based solutions, the only opportunity for the vendor offering LAN-based solutions will often be as a subcontractor.

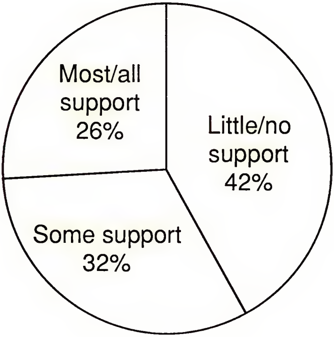
The business issues involved in offering standalone EUS services and system integration services are also generally quite different (see Exhibit IV-9):

- The standalone EUS service is usually aimed at a specific mid-level problem in the organization.

- The importance of LAN issues and expertise is quite high, however.

Exhibit IV-1

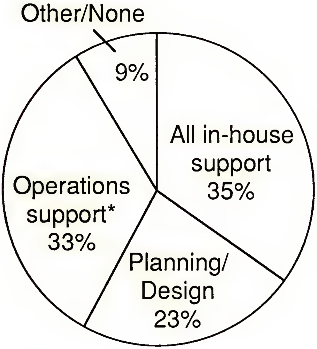
Role of User Organizations in Supporting Their Own Client/Server Systems



Open-ended question coded

Exhibit IV-2

Role of Central Information Systems (IS) Department in Supporting Client/Server Systems

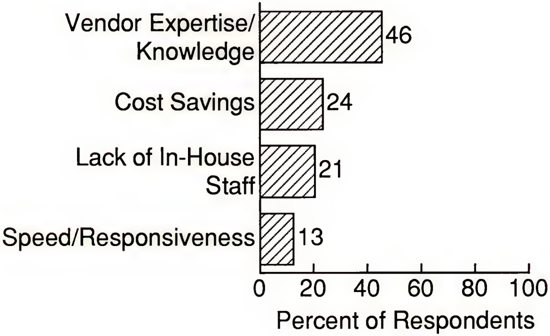


Open-ended question coded

* e.g., troubleshooting, maintenance, help desk

Exhibit IV-3

Major Reasons Given for Using an External Vendor



Open-ended question coded

Note: Multiple responses allowed.

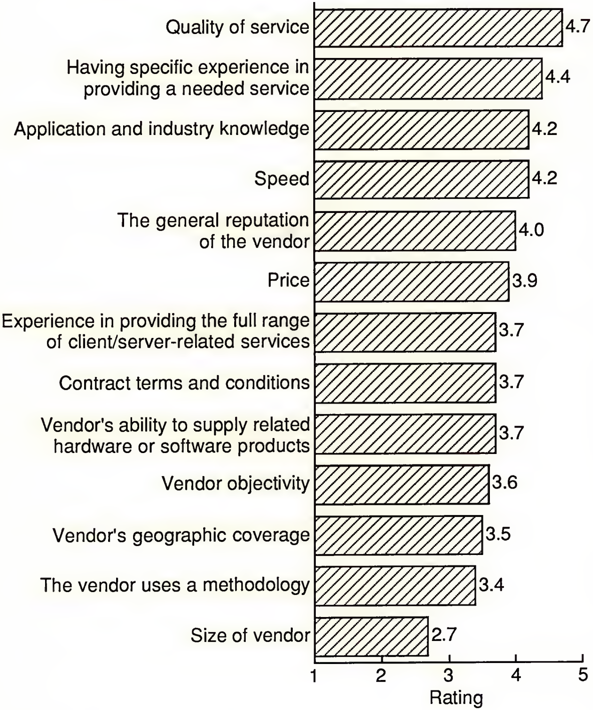
Exhibit IV-4

Examples of Reasons Given for Using an External Vendor

- “Cost, speed, cost again”
- “Price, price, price”
- “In-house expertise not available”
- “Price is cheaper, performance is better, and support after delivery”
- “Not enough time, something is already available”
- “Quick response, technical know-how”
- “Expertise we don't have”
- “Better software than we could write—cheaper”
- “We don't know all there is to install.”
- “They are 'on the inside'.”
- “No staff needed”
- “Limited internal resources, limited time, limited technical staff”
- “More economical—expertise”
- “If you can't write the program, he does”
- “Pharmaceutical data base design—competitive edge”
- “Lack of knowledge internally”
- “Have one-person shop”
- “Government has not trained our people”
- “Can't get the head count”
- “Can't do it in-house, that's all”

Exhibit IV-5

Vendor Selection Criteria

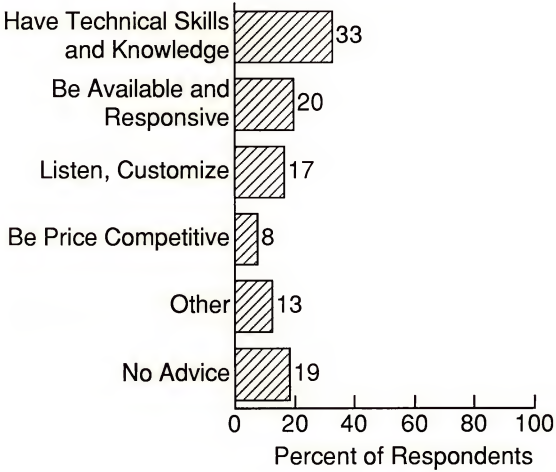


Differences of 0.4 or less are not meaningful.
Key: 1 = not important; 5 = very important

INPUT

Exhibit IV-6

Customer Advice to Prospective Vendors



Open-ended question coded

Note: Multiple responses allowed.

Exhibit IV-7

Examples of Customer Advice to Prospective Vendors

- “Figure out what niche to attack and be good at it”
- “Knowledge of applications, development, and documentation”
- “Keep your knowledge current”
- “Be careful, be as thorough as possible”
- “Train people right”
- “Demonstrate ability”
- “Make sure they know more about a product than the person who made it”
- “Have knowledge of all internal equipment, whether they installed it or not”
- “Be knowledgeable”
- “Know what you are doing”
- “Know the product, work with customers”
- “Understand the market, listen to customers”
- “Cover the whole gambit, hardware and software”
- “Know customers' needs, don't try and change customers”
- “Customize your service to the particular needs of a particular customer”
- “Know your client”
- “Listen to us and know what we need”
- “Be aware of customer's business”
- “Listen to what we are saying”
- “Open an office in Bismarck, ND”
- “Try to have quick response to customers’ needs”

Exhibit IV-8

Contrast Between Systems Integration and Standalone EUS Processes

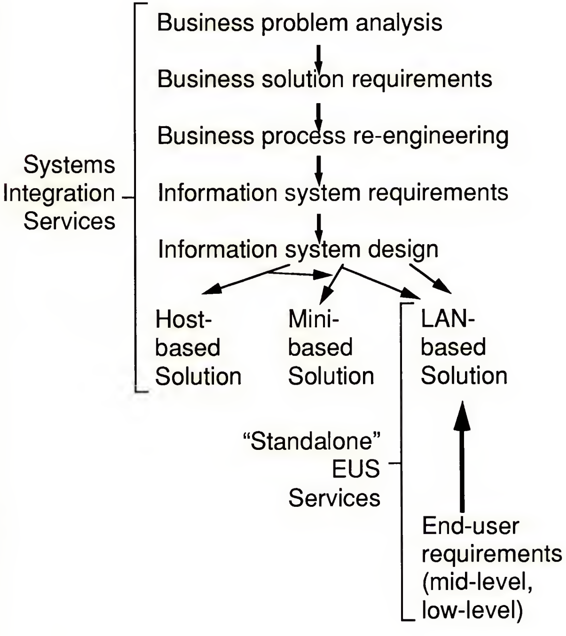

Business problem analysis
Business solution requirements
Business process re-engineering
Information system requirements
Information system design
Host-based Solution
Mini-based Solution
LAN-based Solution
Systems Integration Services
"Standalone" EUS Services
End-user requirements (mid-level, low-level)

Exhibit IV-9

Contrast Between Systems Integration and Standalone EUS Business Issues

Factor	EUS (Standalone)	EUS/SI
Level of Initiator	Middle	High
Business Issue Importance	Medium	High
Relative LAN Importance	High	Low
Size, Duration of Project	Small/Medium	Medium/Large

V

Competitive Position

A

Current Sources of Supply

Two-thirds of respondents were receiving EUS services from local vendors (see Exhibit V-1). IBM was being used by one-quarter of respondents, followed by DEC with 10%, and Novell with 8%; other vendors represented no more than a few percent each.

- "Local vendor" covers a very wide range, as shown by the list of local vendor names collected in the course of the interviews, as shown in Exhibit V-2.
- The IBM proportion may appear surprising at first, since IBM is not yet offering EUS services in an organized manner. INPUT believes the relatively high number of mentions of IBM is due to:
  - Individual trading areas offering EUS services on their own initiative
  - EUS services being supplied as part of a larger contract (e.g., as part of a systems integration contract)
  - Professional services support that involves EUS-type services
  - Sales support functions
  - Education and training offerings
  - Product support

B

User Ratings of Vendors

As part of the interview process, respondents were asked to rate eight specific vendors as well as a category called "local vendor" for their ability to meet EUS service needs.

- As shown in Exhibit V-3, the local service vendors were rated highest, followed by DEC and IBM. (The group from DEC to Andersen received roughly the same rating for their abilities.)

- JWP, Computerland and Bull scored somewhat lower. (Note: JWP is a former regional water company that has diversified into the technical support business; its most recent acquisitions were Neeco and BusinessLand.) Bull was included as a reality check.

INPUT concludes from these ratings that the local vendors currently have an advantage, but the market is still open to most of the well-known names in the industry.

As a follow-up to the structured rating question, INPUT asked respondents to give their impression of vendors' strengths and weaknesses in providing EUS services. These comments were then categorized into the following categories (each category could be a strength and/or a weakness for a vendor):

- Technical skills
- Price
- Industry knowledge
- Reputation
- Ease of doing business

The ratings are useful, but not perfect:

- Inevitably, opinions on the vendors' general capabilities influence their ratings for EUS services. This will be a marketplace reality, however, for some time, so this factor does not greatly lessen the value of the information.

- Well-known vendors will have more opinions, positive or negative.

- No effort was made to scale or weight the responses. Opinions on a vendor's strengths might be held much more strongly or felt to be more important than weaknesses (or vice versa).

However, INPUT feels that these evaluations can be useful guides for positioning and action.

For IBM, technical skills are seen as both a strength and weakness. This probably reflects the wide range of services now offered. Price and ease of doing business are seen almost wholly as weaknesses. Industry knowledge is seen as a mild strength, with reputation the only category where IBM's strengths are seen clearly to outweigh weaknesses. (See Exhibit V-4.)

However, the evaluation of IBM should not be looked at in isolation. In technical skills, for example, IBM is seen as having strength in about the same proportion as other vendors (see Exhibit V-5). Only DEC and EDS are rated markedly higher among the named vendors (with local vendors as a group rated highly also). An area of caution for IBM: only JWP (on a small sample) is seen to be weaker than IBM.

No major vendor was seen as having a price advantage, as shown in Exhibit V-6. Price was seen as a mild weakness for most vendors, with price being mentioned as a weakness for IBM more than any other vendor.

No firm was seen as particularly strong—or weak—in having industry knowledge (see Exhibit V-7). This is especially noteworthy given the importance that users place on industry knowledge (see Exhibits IV-3, IV-5, and IV-6). This situation underlines the fluid nature of the market and the opportunity available for one or more vendors to build a strong position in the market by developing this kind of knowledge.

Except for Computerland, no potential vendor appears to have significant problems concerning its reputation; for most vendors reputation is a strength, as shown in Exhibit V-8.

In ease of doing business, both IBM and EDS are seen as having some problems. For the rest of the firms, this factor is not especially significant (see Exhibit V-9).

C

Relation Between Supplying Products and Services

An issue in this marketplace is the relationship, if any, between supplying EUS-oriented products and services. Respondents were asked if they saw the purchase of EUS products and services as separate activities or as being linked together.

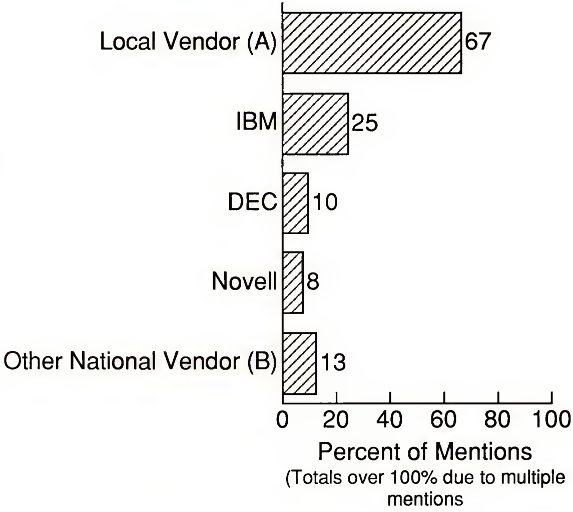
As shown in Exhibit V-10, about one-third of respondents see these as separate activities, while two-thirds saw them linked. Almost half of the respondents see the product vendor as favored in supplying services; only one-fifth see service vendors favored in supplying products.

- Exhibit V-11 shows examples of reasons given by customers for seeing products and services as being separately purchased items.
- Exhibit V-12 shows examples of reasons for seeing product and service linkages.

The key issue for IBM is the extent to which it is (or will be) viewed as a product supplier itself as opposed to VARS or other suppliers in the distribution channel being viewed as the product supplier. INPUT's research did not directly address this issue. However, given the fact that IBM was the single vendor named most often as a supplier of services (see Exhibit V-1), then IBM could benefit from linkage.

Exhibit V-1

Vendors Supplying Services (Number of Mentions)



A: See list in Exhibit V-2

B: Includes Apple, NCR/AT&T, EDS, Andersen, Microsoft, Honeywell, Bull, HP, Wang, and Unisys

Exhibit V-2

Local Service Vendors Cited

- A and V
- Agahi
- Amendata
- Ameridata
- Arthur Andersen
- Avnet
- Austin McDaniel Corp
- Bambard Comp
- Basic
- Bay Resources
- Bell Atlantic
- BusinessLand
- Cabletron
- Cap Gemini
- Cisco
- COIN
- Comark
- Comp Tech Management
- Comptel Comps
- Compucom
- Corporate Business Systems
- Corporate Software
- Cramer
- Crest Computers
- Dale
- Daystar
- Decision Data
- DFM

Exhibit V-2 (con't)

Local Service Vendors Cited

- Dieteam
- Disk
- Dryer Business Products
- Ecom
- EDS
- Egghead Software
- Electyronic Dictation Sys.
- Entree
- Ernst and Young
- Evernet
- Fireside Office Products
- Fourth Shift
- Frederick Computers of Maryland
- Future Now
- GA Computers
- Gardner Group
- Geoquest
- Inacomp
- Independent Consultants
- Info Decisions Inc.
- Intelligent Computer Systems
- Island Graphics
- Johnson Comp
- Kilomets
- Lan Tech
- Lundy
- Macro
- Memorex-Telex

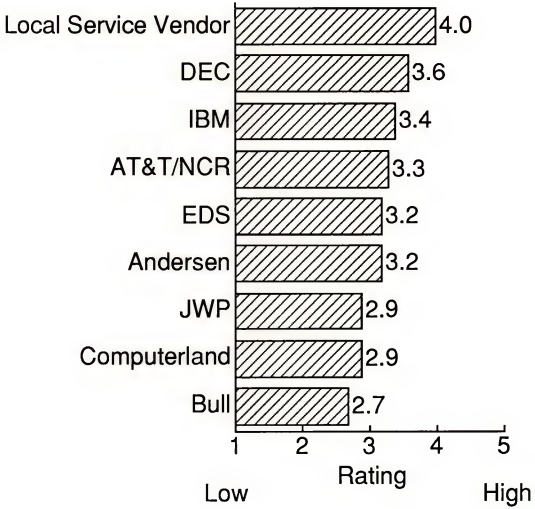
Exhibit V-2 (con't)

Local Service Vendors Cited

- Micon
- Micro Repair
- Microage
- Micromart
- Micronet
- Minx Soft
- MTI Systems
- NC Group
- Networking Concepts
- New England Systems
- New Trend
- Norstand
- Olsi
- Project-Tek
- Quincy St.
- R and D of Colorado Springs
- Siemens-Nixdorf
- Soft Spec.
- Standard Graphics
- Systems Management
- Tech Data
- Telesys Comp
- Thomas-Conrad
- Training a la Carte
- Trellis
- Unitia Business Systems
- Valcom
- Vitech
- Wings

Exhibit V-3

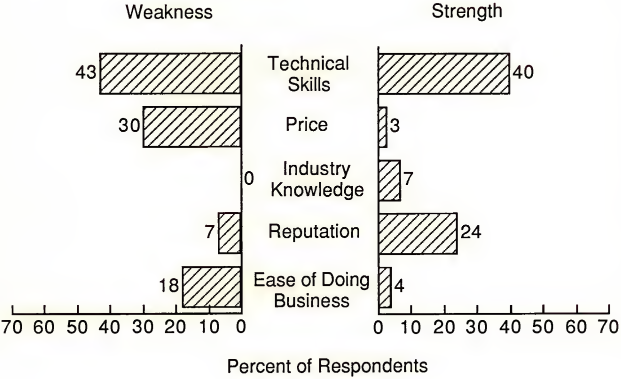
User Rating of Vendors' Ability to Meet User Needs



Differences of 0.4 or less are not meaningful.

Exhibit V-4

IBM Strengths and Weaknesses



Open-ended questions coded

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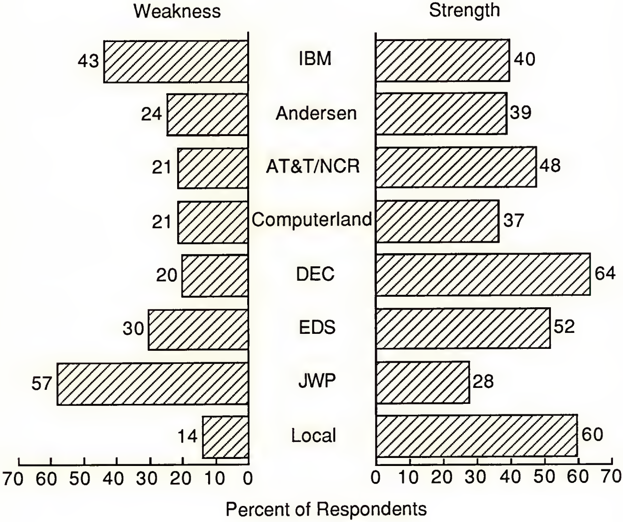
Exhibit V-5

Vendor Strengths and Weaknesses: Technical Skills



Open-ended questions coded

INPUT

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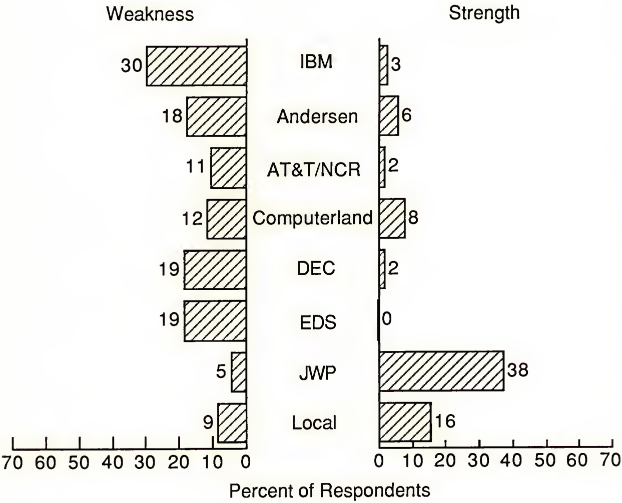
Exhibit V-6

Vendor Strengths and Weaknesses: Price



Open-ended questions coded

INPUT

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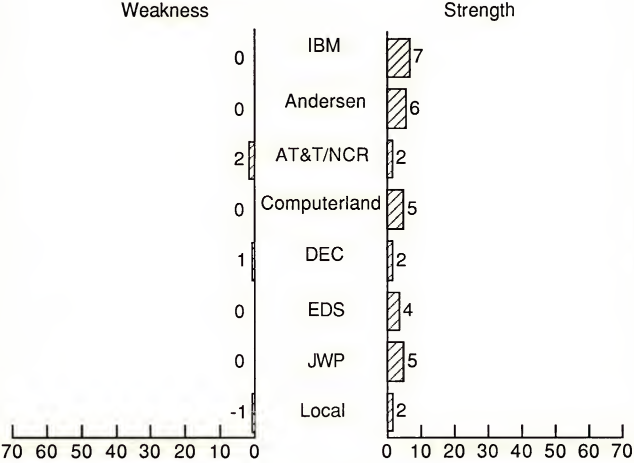
Exhibit V-7

Vendor Strengths and Weaknesses: Industry Knowledge



Percent of Respondents

Open-ended questions coded

INPUT

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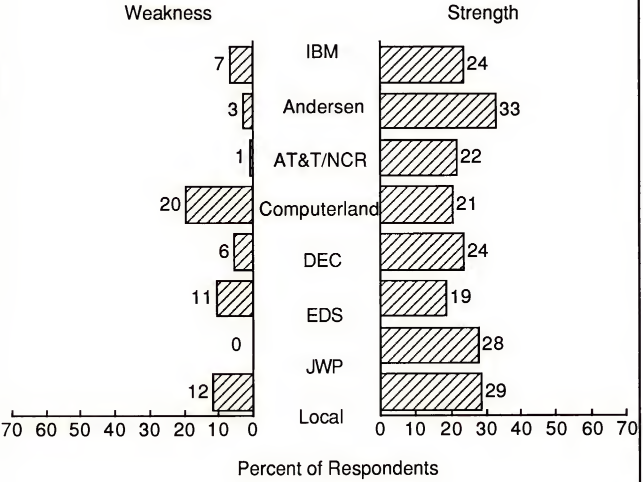
Exhibit V-8

Vendor Strengths and Weaknesses: Reputation



Open-ended questions coded

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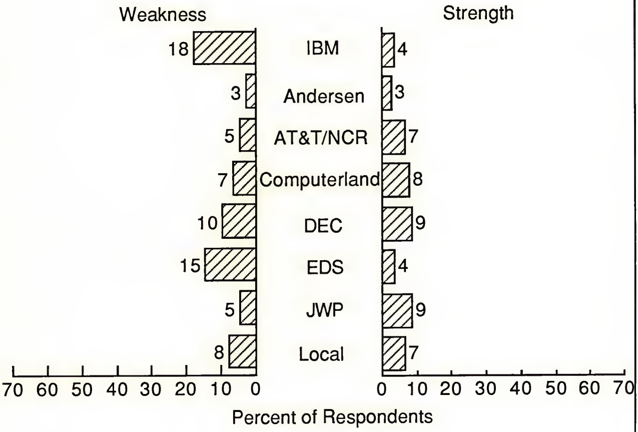
Exhibit V-9

Vendor Strengths and Weaknesses: Ease of Doing Business



Open-ended questions coded

INPUT

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Exhibit V-10

Linkage of EUS Products and Services (Customer's View)

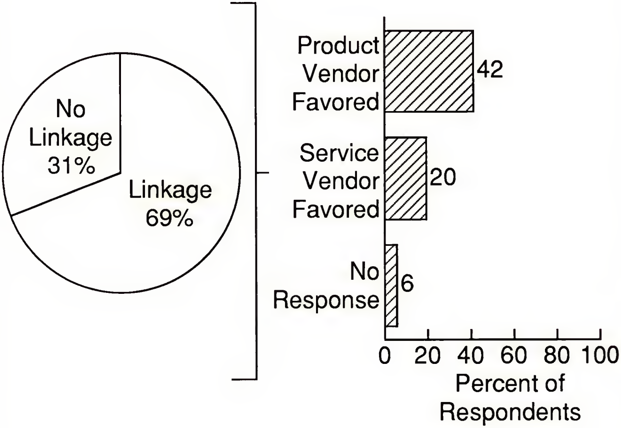

Exhibit V-11

Reasons Given by Customers for Products and Services Purchased Separately

- “Get better prices buying equipment yourself”
- “Can't say”
- “Usually one vendor can't do both things”
- “Flexibility and use our own judgment”
- “Can get products from anyone, but not good service”
- “Two different needs”
- “No one vendor has complete solution”
- “Shop around for best price”
- “Think of separately”

Exhibit V-12

Reasons Given by Customers for Product and Service Linkage

- “One without the other won't work”
- “Everything we do here is linked”
- “Must be hand in hand”
- “We want to minimize number of vendors”
- “Everything must be integrated”
- “Services should always go with product”
- “See it that way”
- “Important to maintain compatibility”
- “More economical”
- “It's obvious—inseparable”
- “Looking for one vendor to supply everything”

A

Client/Server Survey Questionnaire

Client/Server Study

I am calling from INPUT, a research and consulting firm located in Teaneck, New Jersey. We are conducting a study on the use and support of end-user systems, especially that involve client/server systems. We would like you to take part in our study by supplying information in this area. In return for your taking part in our study, we will send you, at no charge, a summary of our findings on completion of our study. Neither your name nor your organization's name will be cited publicly in connection with our findings. My questions will take 20 or 30 minutes. Is this a good time to start?

1a. There are a number of definitions of what client/server consists of. For the purposes of this study a client/server system has these characteristics:

- A server-based local-area network (LAN) that is connected to other LANs or host computer systems.
- Multifunction workstations using Intel or RISC architectures. [A single function workstation like those used on the factory floor or in point-of-sale systems would NOT be included.]
- Note: For this study, we are NOT including server-based LANs that may be used within the information systems (IS) department, mainly for IS technical support.

Does your enterprise have these kind of client/server systems either in use now or planned?

Yes ______ No_______

[If No, thank the respondent, making sure that their name and address are correct, and terminate the interview.]

1b. For what portion of your organization do you have knowledge of client/server status and plans?

Entire organization __________

Function/division/site __________
Describe briefly:

____

____

About how many employees does this include? __________

2. About how many server-related LANs does your organization now have installed? How many do you think will be installed by the end of 1992? 1993? 1994?

	1991	1992	1993	1994
Servers	____	____	____	____
LANs	____	____	____	____

3a. How many PCs and workstations do you have now? How many do you expect to have by the end of 1992, 1993, and 1994? What percentage of your PCs and workstations are attached to server-based LANs now? How do you see this percentage growing up to the end of 1994?

PCs:

1991 _____ 1992 _____ 1993 _____ 1994 _____

% attached:

1991 _____ 1992 _____ 1993 _____ 1994 _____

____

____

____

3b. What percentage of your organization's employees are using server-based LANs now? How do you see this proportion growing in 1992, 1993, and 1994?

1991 _____ 1992 _____ 1993 _____ 1994 _____

____

____

____

4a. How much does your enterprise now spend on client/server systems—broken down into hardware, packaged software, your own staff, and outside personnel and services? How do you expect these to change over the next three years?

	$	$ or % Change		
	1991	1992	1993	1994
Hardware	_____	_____	_____	_____
Packaged Software	_____	_____	_____	_____
Internal Personnel	_____	_____	_____	_____
Outside Personnel/ Services	_____	_____	_____	_____
TOTAL	_____	_____	_____	_____

4b. How much of your staff's time is spent writing software in terms of full-time equivalent personnel?

____

5. What role do the user organizations play in supporting their own client/server systems? How will this change?

____

____

____

6a. What role does the central information systems (IS) department play in supporting client/server systems? (Describe)

____

____

____

6b. How do you expect the IS role to change in the future?

____

____

____

6c. Which of your applications are now in a client/server environment?

____

____

____

What other client/server applications do you expect to have in the future?

____

____

____

I would like to ask you several questions relating to your use of outside services (now or in the future) to support client/server systems.

7. From a services standpoint there are four broad categories of services that can be supplied: (1) strategy and planning; (2) design; (3) implementation; (4) support and operations. Please estimate how much your organization is spending on each of these types of services now, and what your spending levels are likely to be over the next three years.

	$	$ or % Change		
	1991	1992	1993	1994
Strategy & Planning	____	____	____	____
Design	____	____	____	____
Implementation	____	____	____	____
Support and Operations	____	____	____	____
TOTAL	____	____	____	____

8. The four broad categories contain many individual types of services. I will read you a list of these individual services. Please give me a rating of each one's importance to your organization (1 = not important; 5 = very important). If you think the rating will be different in three years, please give me that rating also.

	1991	1994
• Strategy and Planning		
- Analysis of needs	____	____
- Technology plans	____	____
- Application/data Analysis	____	____
- Relationships to other systems	____	____
- Financial justification	____	____
• Design		
- Application design and prototyping	____	____
- LAN design	____	____
- Data base design	____	____
- Product evaluation and selection	____	____
- Configuration design	____	____
- Systems management guidelines	____	____
- Multi-vendor standards	____	____

	1991	1994
• Implementation		
- Product acquisition (including LANs)	____	____
- Hardware installation and testing	____	____
- Connectivity to other networks	____	____
- Packaged software installation and testing	____	____
- Custom software development	____	____
- Multi-vendor hardware integration	____	____
- Multi-vendor software integration	____	____
• Support and Operations		
- Help desk and defect support	____	____
- Problem analysis & performance management	____	____
- Hardware and software changes	____	____
- Backup and recovery	____	____
- LAN operations and management	____	____
- Software distribution	____	____
- Education & training	____	____

9a. What vendors are now supplying services to your organization?

____

____

9b. What types of services are they supplying?

____

____

____

9c. Would you use these vendor(s) again?

Yes ________ No ________

Why? ____

____

____

9d. What additional services, in addition to those you are currently receiving, do you need or expect to use?

____

____

____

10a. What are the three most important reasons for your using an outside provider of services?

____

____

____

10b. How do you select a vendor now?

____

____

11. In selecting an outside provider of service, how important are each of the following vendor characteristics?

(1 = not important at all; 5 = very important)

Having specific experience in providing a needed service _____

Experience in providing the full range of client/server-related services _____

The general reputation of the vendor _____

The vendor uses a methodology _____

Contract terms and conditions _____

Quality of service _____

Vendor's geographic coverage _____

Size of vendor _____

Speed _____

Vendor's ability to supply related hardware or software products _____

Vendor objectivity _____

Price _____

Application and industry knowledge _____

Other (specify)________________ _____

12a. How would you rate the vendors from the list below in their ability to meet your needs? (1 = not qualified; 5 = very qualified; U = don't know enough to rate)

Andersen Consulting _____
AT&T/NCR _____
Bull _____
Computerland _____
DEC _____
EDS _____
IBM _____
JWP _____
A local services vendor _____

12b. Taking three of the vendors that you rated, what do you see as their specific strengths and weaknesses?

Vendor	Strengths	Weaknesses
_____	_____	_____
	_____	_____
_____	_____	_____
	_____	_____
_____	_____	_____
	_____	_____

13. Do you see the purchase of client/server products and client/server services as separate activities or linked together?

- Separate _____
  - Why?

    _____

    _____
  - How do you see this situation changing in the future?

    _____

    _____

- Linked __________
    - Why?

      ____

      ____

    - Does this mean that the product vendor is likely to be favored to supply services?

      [ ] **OR**

    - Would the vendor supplying services (such as design) be looked to supply the product as well?

      [ ]

    - How do you see this situation changing in the future?

      ____

      ____

      ____

14. Are there other issues relating to the support of client/server systems that you believe are important?

    ____

    ____

    ____

15. If a vendor were planning to offer support services for client/server systems, what kind of advice would you give them?

    ____

    ____

    ____

16. If respondent was knowledgeable about only a part of the organization:

    Who else could I speak with to learn more about your organization's client/server activities?

    ____

    ____